IN THE CLAIMS:

Please amend the claims as follows:

1. (Original) A method for compensating for polarization mode dispersion in an optical fiber communication system, comprising the steps of:

reducing said polarization mode dispersion using a cascade of all-pass filters; and

adjusting coefficients of said all-pass filters using a least mean square algorithm

2. (Original) The method of claim 1, wherein said cascade of all-pass filters comprises a two-channel structure consisting of multiple cascades of all-pass filters and directional couplers.

3 (Original) The method of claim 1, wherein said coefficient values are adjusted to minimize a cost function.

4. (Original) The method of claim 1, further comprising the step of measuring said polarization mode dispersion in a received optical signal

5 (Original) The method of claim 4, wherein said measuring step employs a tunable narrowband optical filter to render information from energy detector measurements

6 (Currently Amended) The method of claim 1, wherein said cascade of all-pass filters comprises a first all-pass filter A having a vector a comprised of P coefficients and a second all-pass filter B having a vector b comprised of Q coefficients and wherein said least mean square algorithm adjusts said coefficients as follows:

$$w(n+1) = w(n) - \mu \nabla(J),$$

where n indicates the current iteration number and w is a composite coefficient vector defined as:

$$w = \begin{bmatrix} a \\ b \end{bmatrix}, \quad \nabla(J) \equiv \begin{bmatrix} \dfrac{\partial J}{\partial a^T} & \dfrac{\partial J}{\partial b^T} \end{bmatrix}^T$$

is the $(P+Q) \times 1$ complex gradient of J with respect to w and T indicates a transpose operation, and

$$\frac{\partial J}{\partial a^T} \equiv \begin{bmatrix} \dfrac{\partial J}{\partial a_1} & \dfrac{\partial J}{\partial a_2} & \dfrac{\partial J}{\partial a_P} \end{bmatrix}, \text{ and}$$

$$\frac{\partial J}{\partial b^T} \equiv \left[\begin{array}{cccc} \dfrac{\partial J}{\partial b_1} & \dfrac{\partial J}{\partial b_2} & \cdots & \dfrac{\partial J}{\partial b_Q} \end{array} \right].$$

7. (Original) A method for compensating for polarization mode dispersion in an optical fiber communication system, comprising the steps of:

reducing said polarization mode dispersion using a cascade of all-pass filters; and

adjusting coefficients of said all-pass filters using a Newton algorithm.

8 (Original) The method of claim 7, wherein said cascade of all-pass filters comprises a two-channel structure consisting of multiple cascades of all-pass filters and directional couplers

9 (Original) The method of claim 7, wherein said coefficient values are adjusted to minimize a cost function.

10 (Original) The method of claim 7, further comprising the step of measuring said polarization mode dispersion in a received optical signal.

11 (Original) The method of claim 10, wherein said measuring step employs a tunable narrowband optical filter to render information from energy detector measurements

12 (Currently Amended)The method of claim 7, wherein said <u>cascade of all-pass filters comprises a first all-pass filter A having a vector a comprised of P coefficients and a second all-pass filter B having a vector b comprised of Q coefficients and wherein said</u> Newton algorithm adjusts said coefficients as follows:

$$w(n+1) = w(n) - \mu H^{-1} \nabla(J)$$

where <u>n indicates the current iteration number and</u> w is a composite coefficient vector defined as:

$$w = \left[\begin{array}{c} a \\ b \end{array} \right], \quad \nabla(J) \equiv \left[\begin{array}{cc} \dfrac{\partial J}{\partial a^T} & \dfrac{\partial J}{\partial b^T} \end{array} \right]^T$$

$$\frac{\partial J}{\partial a^T} \equiv \left[\begin{array}{cccc} \dfrac{\partial J}{\partial a_1} & \dfrac{\partial J}{\partial a_2} & & \dfrac{\partial J}{\partial a_P} \end{array} \right], \text{ is the } (P+Q) \times 1 \text{ complex gradient of } J \text{ with respect to } w, \underline{T \text{ indicates a}}$$

<u>transpose operation and</u>, a Hessian matrix, H, is defined as follows:

$$H = \frac{\partial^2 J}{\partial w \partial w^T} = \begin{bmatrix} \dfrac{\partial^2 J}{\partial a \partial a^T} & \dfrac{\partial^2 J}{\partial a \partial b^T} \\ \dfrac{\partial^2 J}{\partial b \partial a^T} & \dfrac{\partial^2 J}{\partial b \partial b^T} \end{bmatrix} \text{ and}$$

$$\frac{\partial J}{\partial b^T} \equiv \begin{bmatrix} \dfrac{\partial J}{\partial b_1} & \dfrac{\partial J}{\partial b_2} & \cdots & \dfrac{\partial J}{\partial b_Q} \end{bmatrix}$$

13.   (Original) A polarization mode dispersion compensator in an optical fiber communication system, comprising:

a cascade of all-pass filters having coefficients that are adjusted using a least mean square algorithm.

14.   (Original) The polarization mode dispersion compensator of claim 13, wherein said cascade of all-pass filters comprises a two-channel structure consisting of multiple cascades of all-pass filters and directional couplers.

15.   (Original) The polarization mode dispersion compensator of claim 13, wherein said coefficient values are adjusted to minimize a cost function.

16   (Original) The polarization mode dispersion compensator of claim 13, further comprising the step of measuring said polarization mode dispersion in a received optical signal.

17   (Original) The polarization mode dispersion compensator of claim 16, wherein said measuring step employs a tunable narrowband optical filter to render information from energy detector measurements.

18.   (Original) A polarization mode dispersion compensator in an optical fiber communication system, comprising:

a cascade of all-pass filters having coefficients that are adjusted using a Newton algorithm.

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19   (Original) The polarization mode dispersion compensator of claim 18, wherein said cascade of all-pass filters comprises a two-channel structure consisting of multiple cascades of all-pass filters and directional couplers

20   (Original) The polarization mode dispersion compensator of claim 18, wherein said coefficient values are adjusted to minimize a cost function

21   (Original) The polarization mode dispersion compensator of claim 18, further comprising the step of measuring said polarization mode dispersion in a received optical signal

22   (Original) The polarization mode dispersion compensator of claim 21, wherein said measuring step employs a tunable narrowband optical filter to render information from energy detector measurements.